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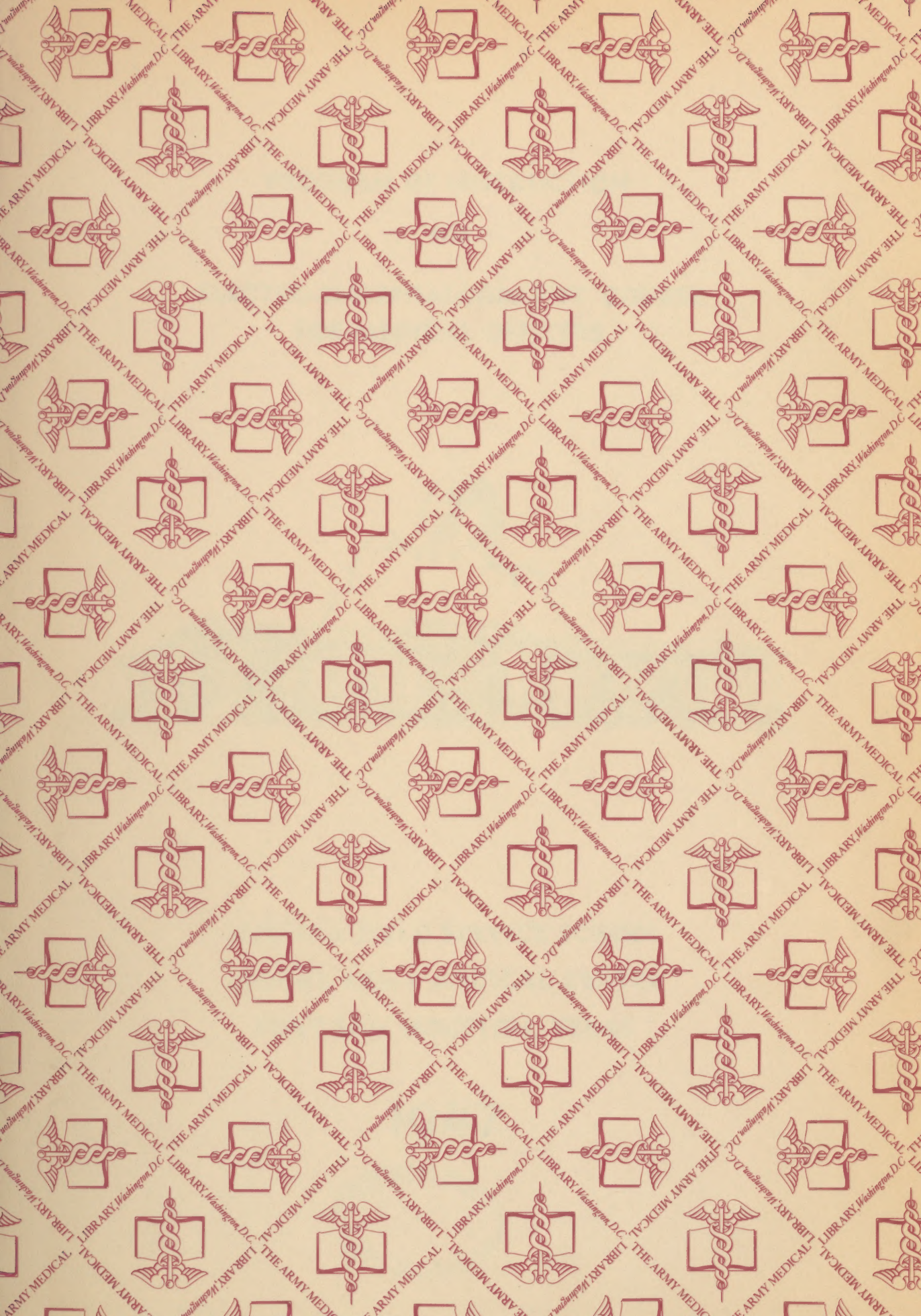
U.S. MEDICAL FIELD SERVICE SCHOOL,
Fort Sam Houston, Tex.

PROGRAM OF INSTRUCTION no.3

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PROGRAM OF INSTRUCTION
FOR
ELECTRO-ENCEPHALOGRAPHY COURSE
FOR MEDICAL OFFICERS



MEDICAL FIELD SERVICE SCHOOL
BROOKE ARMY MEDICAL CENTER
FORT SAM HOUSTON, TEXAS

1947



U.S. MEDICAL FIELD SERVICE SCHOOL, *Fort Sam Houston, Tex.*

BROOKE ARMY MEDICAL CENTER

FORT SAM HOUSTON, TEXAS

PROGRAM OF INSTRUCTION

FOR

ELECTRO-ENCEPHALOGRAPHY COURSE FOR

MEDICAL OFFICERS (MO-26)

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ELECTRO-ENCEPHALOGRAPHY COURSE

FOR

MEDICAL OFFICERS

MEDICAL FIELD SERVICE SCHOOL

PURPOSE:

The objective of this course is to provide the Medical Officer with that skill and understanding necessary to direct an electro-encephalographic laboratory; to interpret electro-encephalographic records in terms of his knowledge of the neuro-psychiatric disease entities; supervise the work of electro-encephalography technicians; standardize four-channel and six-channel electro-encephalographics; acquaint medical personnel with the indications for electro-encephalographic studies; coordinate electro-encephalographic findings with the clinical picture; to devise solutions for special problems of recording.

PREREQUISITES:

- a. Completion of Basic Course for MD Officers or its equivalent.
- b. Completion of Basic NP Course for Medical Officers or its equivalent.
- c. Specialty rating as Neuropsychiatrist (3130).
- d. Special neurological training is desirable but not essential.

ELECTRO-ENCEPHALOGRAPHY COURSE FOR MEDICAL OFFICERS
(4 weeks, 160 hours)

SUBJECT	HOURS
<u>BASIC</u>	28
Electrical and Electronic Fundamentals	(19)
Neuro-anatomy and Neurophysiology as applied to Electro-encephalography	(8)
History of Electro-encephalography	(1)
<u>COMMANDANT'S TIME</u>	8
Class Organization	(2)
Clearance and Graduation	(2)
Subjects to be Announced	(4)
<u>PRINCIPLES AND PRACTICE OF ELECTRO-ENCEPHALOGRAPHY</u>	100
Electro-encephalographic Laboratory; Installation, Organization, and Management	(15)
Operational Training	(40)
Record Classification and Interpretation	(45)
<u>TRAINING</u>	24
Physical Training	(20)
Troop Information	(4)

PROGRAM OF INSTRUCTION

ELECTRO-ENCEPHALOGRAPHY COURSE FOR MEDICAL OFFICERS

PART I

BASIC
28 Hours

SUBJECT AND ANNEX NUMBER	HOURS	SCOPE
Electrical and Electronic Fundamentals ANNEX NO. 1	(19)	A survey of the electrical basis of matter, elementary electricity and electronics, electrical measurements, vacuum tubes and tube testing, and amplifier circuits.
Neuro-anatomy and Neuro- physiology as applied to Electro-encephalography ANNEX NO. 2	(8)	A review of the structure and function of the central nervous system, especially the cerebral cortex, with particular regard to the principles of electrical activity of the central nervous system and the origin of EEG potentials; the physiology of anoxia.
History of Electro- encephalography ANNEX NO. 3	(1)	A survey of the development of thought and method concerning the recording of cerebral potentials and the interpretation and analysis of the results.

PART II

COMMANDANT'S TIME
8 Hours

SUBJECT AND ANNEX NUMBER	HOURS	SCOPE
Class Organization ANNEX NO. - None	(2)	Processing of students, issue of textbooks, organization of students into groups

PART II (Cont'd)

SUBJECT AND ANNEX NUMBER	HOURS	SCOPE
		for instructional purposes, address by Commandant and such other administrative procedures as announced by the Commandant.
Clearance and Graduation ANNEX NO. - None	(2)	Turning in of supplies and equipment, processing and clearance and formal graduation exercises.
Subjects to be Announced ANNEX NO. - None	(4)	Conferences with professional consultants of The Surgeon General's Office.

PART III

PRINCIPLES AND PRACTICE OF ELECTRO-ENCEPHALOGRAPHY 100 Hours

SUBJECT AND ANNEX NUMBER	HOURS	SCOPE
Electro-encephalographic Laboratory; Installation, Organization and Management ANNEX NO. 4	(15)	A study of the design, installation and maintenance of electro-encephalographic apparatus, organization, structure, and management of the laboratory, and job planning and analysis.
Operational Training ANNEX NO. 5	(40)	Training in the operation of the electro-encephalographic apparatus in routine and special recording techniques. Artifact analysis.
Record Classification and Diagnosis ANNEX NO. 6	(45)	A study of the principles of EEG record analysis. Survey of the normal EEG and its physiological variations, and EEG abnormalities in disorders of the nervous system. Practical training in methods of EEG classification and interpretation.

PART IV

TRAINING
24 Hours

SUBJECT AND ANNEX NUMBER	HOURS	SCOPE
Physical Training ANNEX NO. 7	(20)	To develop and maintain a high level of physical fitness in the individual by conditioning exercises and competitive athletics.
Troop Information ANNEX NO. 8	(4)	To inform the Medical Officer on matters of significance to him in connection with his military duties and to afford a source of general information on topics of national interest.

ANNEX NO. 1

ELECTRICAL AND ELECTRONIC FUNDAMENTALS
(19 Hours)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
Electrical Fundamentals	6	A general survey of electron theory, magnetism, Ohm's law, electrical power, series and parallel circuits, AC- DC action, inductance and capacitance, cells and batteries, trans- formers.	L,G, D,F	TM 1-455; TF's 11-622, 11-1200, 11-1187, 11- 1219, 1-402; Misc.Film's 1087, 1088.
Electrical Measurements	7	Principles of meters: galvan- ometer, AC and DC meters, ohmmeters, ammeters, hot wire and thermocouple meters, multitest meters. Practical problems in resist- ance, voltage and amperage measure- ment; meter mainte- nance.	L,C, D, PE	TM's 1-455, 11-472; TB SIG 136.
Electronic Fundamentals	6	A General review of the principles of vacuum tubes, tube testing, amplifier theory and design, power supply and electronic recording apparatus. Introduction to EEG circuit design.	L,C, D,F	TM 11-455; TF's 1-470, 1-471, 1- 472.

ANNEX NO. 2

NEURO-ANATOMY AND NEUROPHYSIOLOGY AS APPLIED
TO ELECTRO-ENCEPHALOGRAPHY
(8 Hours)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
Basic Neuro- anatomy and Neurophysiology as Applied to Electro- encephalography	3	Review of scalp and skull configuration, topographical rela- tions of skull and cranial contents, anatomy, histology and blood supply of cerebral cortex, basal ganglia, cere- bellum and diencephalon, afferent, efferent and association pathways, principles of cerebral localization.	C,D	Ranson, Ana- tomy of Ner- vous System; Strong & Elwyn, Human Neuro-anatomy; Fulton, Phy- siology of Nervous Sys- tem; Penfield and Erickson, Epilepsy and Cerebral Localization; McCulloch, W.S., The Functional Organization of the Cere- bral Cortex; Physiology Review 24: 390, 1944; Fulton-Howell, Textbook of Physiology, Sec. I, II, III.
Cerebral Metabolism	1	A survey of the sig- nificant features of cerebral metabolism of oxygen, glucose and vitamins. Physiological effects of hyperventil- ation, anoxia and hypo- glycemia.	C,D	Best and Taylor, Physi- ological Basis of Medical Practice; Page, Brain Metabolism; Peters and Van Slyke, Quantitative Clinical Chem- istry, Vol.I; Quastel, J.H., Respiration in the CNS; Physi- cal Review 19: 135, 1939.

ANNEX NO. 2 (Cont'd)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
Electrical Mechanisms of Nerve Action	1	Introduction to the electrical activity of the nervous system; physico-chemical mechanisms, production of EMF, excitation, conduction and response. Review of the properties of the nerve impulse and action potentials.	C,D	Fulton-Howell, Textbook of Physiology, Ch. 1-6; Symposium on The Synapse, C.C. Thomas, 1939; Physico-Chemical Mechanism of Nerve Activity, Ann. N.Y. Acad.Sci. XLVII, 1946.
Electrical Activity of the Central Nervous System.	3	A survey of architectonics and electrical activity of the brain, records of activity of linear tracts in the CNS, electrical excitability of the cerebral hemispheres, conduction of cortical impulses, spontaneous electrical activity of the cerebral cortex and its properties, origin of the spontaneous activity of the cerebrum.	C,D	O'Leary, J.L. Ch.III, in Precentral Motor Cortex, Bucy, 1944; Fulton-Howell, Text. of Physiology, Ch. 7-25; Adrian, E. D. and Moruzzi, G., Impulses in the Pyramidal Tract, J. Physiol, <u>97</u> , 153, 1939; Hoefer, P.F.A. and Pool, J., Conduction of Cortical Impulses, Arch. Neurol. and Psychiat. <u>50</u> , 381, 1943; Adrian, E.D., The Localization of Activity in the Brain, Proc. Roy. Soc. B., <u>126</u> , 433, 1939; Bishop, G.H., The Interpretation of

ANNEX NO. 2 (Cont'd)

SUBJECT AND		SCOPE OF	TYPE OF
FILE NUMBER	HOURS	INSTRUCTION	INSTRUCTION REFERENCES
			<p>Cortical Potentials, Cold Spring Harbor Symposia, IV, 1936; Jasper, H.H., Cortical Excitatory State and Synchronism in The Control of Bioelectric Autonomous Rhythms, Cold Spring Harbor Symposia, IV, 1936; Adrian, E.D., General Principles of Nervous Activity, Brain, 70,1, 1947; Bishop, G.H., The Relation of Bioelectric Potentials to Cell Functioning, Ann. Rev. Physiol. 3, 1941; Gibbs, F. A., The Electrical Activity of the Brain, Ann. Rev. Physiol. 7, 1945; Jasper, H. and Kershman, J., Electro-encephalography in Spiegel, E.A., Progress in Neurology and Psychiatry, 1, 1946; Hoagland, H., Chemical Pacemakers and Physiological Rhythms, in Alexander J., Colloid Chemistry, New York,</p>

ANNEX NO. 2 (Cont'd)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
				1944, Vol. 5; O'Bradord, S., Effect of Hypo- thalamic Lesions on Electrical Activity of the Cerebral Cortex, J. Neurophys- iol, <u>6</u> , 81, 1943; Kennard, M.A., Effects on EEG of Chronic Lesions of Basal Ganglia, Thala- mus and Hypo- thalamus of Mon- keys, J. Neuro- physiol, <u>6</u> , 405, 1943.

ANNEX NO. 3

HISTORY OF ELECTRO-ENCEPHALOGRAPHY
(1 Hour)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
History of Electro- encephal- ography	1	A survey of the hist- orical development of Electro-encephal- ography correlating knowledge of neuro- anatomy, neurophys- iology and electrical recording techniques and the interpretation and analysis of results. Review of the develop- ment of EEG usage in neuropsychiatric diag- nosis.	C	Gibbs and Gibbs, Atlas of EEG; Penfield and Erickson, Epilepsy and Cerebral Localization.

ANNEX NO. 4

ELECTRO-ENCEPHALOGRAPHIC LABORATORY INSTALLATION
ORGANIZATION AND MANAGEMENT
(15 Hours)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
Design of EEG Apparatus	2	Study, demonstration and individual analysis of the EEG apparatus: pre-amplifier, power amplifier and recording device circuits, construction and specification.	C,D, PE	Grass, Instruction Manual for the Electro-encephalograph; Gibbs, Atlas of EEG, Appendix A.
Installation of EEG Apparatus	3	A review of plans of EEG laboratory installation in different locations, arrangement of laboratory space and rooms, necessary furniture, line connections, problems in shielding and air conditioning, setting up and connecting the various components of the apparatus.	C,D PE	Grass, Instruction Manual for the Electro-encephalograph; Ogilvie, Manual of EEG for Technicians.
Maintenance of EEG Apparatus	3	Analysis of replacement parts, care and maintenance of the various components of the apparatus, spare tubes, batteries and battery charging, special care of the inkwriters; practical problems in electrical measurements.	C,D, PE	Grass, Instruction Manual for the Electro-encephalograph; Ogilvie, Manual of EEG for Technicians.
Laboratory Organization and Management	7	A study of the role of the EEG laboratory in relation to the neuropsychiatric and other hospital services; the management of the laboratory	C,D, PE	Grass, Instruction Manual for the Electro-encephalograph; Ogilvie, Manual of EEG for Technicians.

ANNEX NO. 4 (Cont'd)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION REFERENCES
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with regard to the work of the technician and instruction of technicians, job planning and analysis, methods of scheduling, reporting diagnoses, file system for reports, records, and museum maintenance. Practical exercises in laboratory supervision.

ANNEX NO. 5

OPERATIONAL TRAINING
(40 Hours)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
Electrodes and Electrode Application	6	A practical study of the different types of electrodes, their construction and application. Monopolar and bipolar connections. Electrode resistance and electrical skin resistance factors.	PE	TB MED 74; Gibbs and Gibbs, Atlas of EEG; Grass, Manual of the EEG; Ogilvie, Manual of EEG for Technicians.
Recording Techniques	26	Practical work in the technique of the various recording routines: 4 and 6 channel, 8, 10, and 16 leads, monopolar and bipolar methods. Special routines of triangulation, sleep records. Hyperventilation technique. Preparation of the patient and management of the patient during the recording; techniques of electromyography.	PE	TB MED 74; Gibbs and Gibbs, Atlas of EEG; Ogilvie, Manual of EEG for Technicians; Grass, Manual of the EEG.
Artifact Analysis	8	A practical study of the methods of detection, analysis and correction of artifacts that occur in EEG recording. Routine and experimental records will be used to review artifacts produced by the patient, the electrodes, the apparatus, and the environment.	PE	TB MED 74; Gibbs and Gibbs, Atlas of EEG; Ogilvie, Manual of EEG for Technicians; Grass, Manual of the EEG.

ANNEX NO. 6

RECORD CLASSIFICATION AND DIAGNOSIS
(45 Hours)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
Principles of EEG Record Analysis	2	The principles and methods of EEG record analysis by visual techniques. Scope and limitations. Statistical methods of o/o - time fre- quency analysis. Fre- quency spectra by fourier transform and electronic analysis.	C,D	Gibbs and Gibbs, Atlas of EEG; Jasper, Electro- encephalography, in Penfield and Erickson, Epilepsy and Cerebral Local- ization, Ch. XIV; Dawson, G.D., and Walter, W.G., The Scope and Limitation of Visual and Automatic Ana- lysis of the EEG, J. Neurol. and Psychiat. 7, 119, 1944.
The Normal EEG	1	Classification of normal records. Dominant types of frequencies and wave forms. The normal frequency spectrum of individual records and of the general population.	C,D	Gibbs and Gibbs, Atlas of EEG; Jasper, Electro- encephalography, in Penfield and Erickson, Epilepsy and Cerebral Local- ization, Ch. XIV; TB MED 74; Gibbs, Gibbs and Lennox, EEG Classifi- cation of Epileptic pat- ients and con- trol subjects, Arch. Neurol. and Psychiat. 50, 111, 1943. Gibbs, Cortical

ANNEX NO. 6 (Cont'd)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPES OF INSTRUCTION REFERENCES
			<p>Frequency Spectra of Healthy Adults, J. Nerv. and Ment. Dis. 25, 417, 1942; Brazier and Finesinger, Characteristics of The Normal EEG, J. Clin. Inv. 23, 303, 1944; Engel et al, A Simple Method of Deter- mining Frequency Spectrumes in The EEG, Arch. Neurol. and Psychiat. 51, 134, 1946; Kaufman, I.C. and Hoagland, H., Dominant Brain Wave Fre- quencies as Measures of Physi- cochemical Pro- cesses in Cere- bral Cortex, Arch. Neurol. and Psychiat., 56: 207, 1946; Davis, P.A., Technique and Evaluation of the EEG, J. Neurophysical., 1941, 4, 92; Darrow, C., The EEG and Psycho- physiological Regulation in The Brain, Am. J. Psychiat., 102, 791, 1946;</p>

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
				Lindsley, D.B., EEG, Ch.33 in J. McV. Hunt, Personality and Behavior Dis- orders, Ronald Press, N.Y., 1944; Greenblatt, M., Funkenstein, D., et al, EEG Patterns from the Base of the Brain, Am.J. Psychiat. <u>103</u> , 749, 1947.
Physiological Variations in The Electro- encephal- ogram	2	A Study of variations in the EEG with regard to age, acid- base balance, hyperven- tilation, sleep, blood sugar level, tension states and personality correlations.	C,D	All previous references. Henry, C.E., EEG's of Nor- mal Children; Monographs of the Society for Research in Child Development IX, Nat. Res. Council, 1944; Chon, R., The Influence of Emotion on the EEG, J. Nerv. and Ment. Dis. <u>104</u> , 351, 1946; Davis, H., and Wallace, W.M., Factors Affecting Changes Pro- duced in EEG by Standard- ized Hyperven- tilation; Arch. Neurol. Psychiat. <u>47</u> , 606, 1942;

ANNEX NO. 6 (Cont'd)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
				Gibbs, F.A., Gibbs, E.L., and Lennox, W. G., EEG Response to Overventila- tion and its Relation to Age, J. Pediat. <u>23</u> , 497, 1943; Sugar, O., Asymmetry in Occipital Electro-enceph- alograms, Dis. Nerv. Sept. 8, 3, 1947; Blake, H., Gerard, R.W., and Kleitman, N., Factors Influen- cing Brain Poten- tials During Sleep, J. Neuro- physiol, <u>2</u> , 48, 1939.
Significance and Analysis of Alpha Activity	1	A review of the pro- perties of the alpha rhythm, its signifi- cance, localization and relation to vis- ual and mental acti- vity, correlation to personality structure, conditioning and response in hypnosis.	C,D	All above refer- ences, especially Gibbs and Gibbs, Lindsley, Sugar, Brazier and Finesinger, (loc. cit.); Adrian, E.D., and Yomagiwa, K., The Origin of the Berger Rhythm, Brain, <u>58</u> , 322, 1935.
Principles of Local- ization by Electro- encephal- ography	1	A study of the methods of detecting focal lesions by electro-encephal- ography using mono- polar and bipolar methods. Focal signs and their	C,D	Gibbs and Gibbs, Atlas of EEG; Jasper, EEG, in Penfield and Erickson, Epilepsy and Cerebral Local- ization; Walter,

ANNEX NO. 6. (Cont'd)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
		interpretation. Principles and practice of phase reversal and triangulation.		W.G., The EEG in Cases of Cerebral Tumor, Proc. Roy. Soc. Med., March, 1937; Case T.J., and Bucy, P.C., Localization of Cerebral Lesions by Electro-encephalography, J. Neurophysiol. <u>1</u> , 245, 1938; Jasper, H.H. and Howhe, W.A., EEG IV, Localization of Seizure Waves in Epilepsy, Arch. Neurol. and Psychiat., <u>39</u> , 885, 1938; Aird, R.B., and Bowditch, S.C., Cortical Localization by Electro-encephalography, J. Neurosurg. <u>3</u> , 407, 1946; Williams, D. and Reynell, R., Abnormal Suppression of Cortical Frequencies, Brain, <u>68</u> , 123, 1945.
Electro-encephalography in Epilepsy	2	A study of the electro-encephalographic findings in epilepsy during and between seizures. The types of seizure patterns, classification,	C,D	Gibbs and Gibbs, Atlas of EEG; Jasper, H.H., in Penfield and Erickson, Epilepsy and Cerebral Localization; Echlin,

ANNEX NO. 6 (Cont'd)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION REFERENCES
		<p>statistical distribution, significance of focal signs and methods of evaluating records and cases and reporting findings are reviewed. Relationship between paroxysmal cerebral dysrhythmia and problems of inheritance in epilepsy. Adjuvant techniques for bringing out seizure patterns. Use of EEG in following cases during treatment.</p>	<p>F.A., The EEG Associated with Epilepsy, Arch. Neurol. and Psychiat. <u>52</u>, 270, 1944; Gibbs, F.A., Lennox, W.G., and Gibbs, E.L., EEG classification of Epileptic Patients and Control Subjects, Arch. Neurol. and Psychiat. <u>50</u>, 111, 1943; Gibbs, E.L., Merritt, H.H., and Gibbs, F.A., Electro-encephalographic Foci Associated with Epilepsy, Arch. Neurol. and Psychiat. <u>49</u>, 793, 1943; Jasper, H. and Kershman, J., EEG Classification of the Epilepsies, Arch. Neurol. and Psychiat. <u>45</u>, 903, 1941; Cohn, R., and Cruvant, B.A., Relation of Narcolepsy to the Epilepsies, Arch. Neurol. and Psychiat. <u>51</u>, 163, 1944; Williams, D., Significance of an Abnormal EEG, J. Neurol. and Psychiatry.</p>

ANNEX NO. 6 (Cont'd)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
				<p>4, 257, 1942; Williams, D., The Nature of Transient Out- bursts in the EEG of Epilep- tics, Brain, 67, 10, 1944; Lennox, W., Gibbs, E.L., and Gibbs, F. A., Inherit- ance of Cere- bral Dysrhy- thmia and Epilepsy, Arch. Neurol. and Psychiat. 44, 1155, 1940; Epilepsy, ARNMD Mono- graph XXVI, 1946; Dawson, G.D., The Rela- tion Between the EEG and Muscle Action Potentials in Certain Con- vulsive States, J. Neurol., Neurosurg. and Psychiat. 2, 5, 1946; Cobb, W.A., Rhythmic Slow Discharges in the Electro- encephalogram, J. Neurol., Neurosurg. and Psychiat. 2, 65, 1946.</p>
Electro- encephal- ography in Head Injury	2	A study of the electro-encephal- ogram in the evaluation of	C,D	Trauma of The Central Nervous System, ARNMD Monograph XXIV,

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION REFERENCES
		cases of head injury, post-traumatic states and post-traumatic epilepsy. Focal and general changes. Diagnostic and prog- nostic considera- tions.	1945, (Articles by Jasper et al and Walker et al complete bibliography); Jasper, EEG, in Penfield and Erickson, Epilepsy and Cerebral Local- ization; Jasper, H.H., Kershman, J., and Elvidge, A., EEG Studies of Injury to the Head, Arch. Neurol. and Psychiat. <u>44</u> , 328, 1940; Hoefler, P.F.A., The EEG in Cases of Head Injury, Ch.23, in Brock, Injuries of the Skull, Brain and Spinal Cord, 1943; Gibbs, F.A., Wegner, W.R., and Gibbs, E., The EEG in Post-Traumatic Epilepsy, Am. J. Psychiat. <u>100</u> , 738, 1944; Dow, R.S., Ulett, G., and Roof. J., EEG Studies in Head Injuries, J. Neurosurg. <u>2</u> , 154, 1945; Williams, D., The EEG in Chronic Post- Traumatic States, J.

ANNEX NO. 6 (Cont'd)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
				Neurol. and Psychiat. <u>4</u> , 131, 1941; Williams D., The EEG in Acute Head Injuries, J. Neurol. and Psychiat. <u>4</u> , 107, 1941; Williams, D., The EEG in Traumatic Epilepsy J. Neurol. and Psychiat. <u>7</u> , 103, 1944.
Electro- encephal- ography and Brain Tumors	2	A study of the EEG in the evaluation of cases of brain tumor with regard to localization, specific pathology and differential diagnosis.	C,D	Gibbs and Gibbs, Atlas of EEG; Jasper, EEG, in Pen- field and Erickson, Epil- epsy and Cere- bral Local- ization; Yeager, C.L., and Luse, A.R., EEG Local- ization and Differentiation of Usions of Frontal Lobes Arch. Neurol. and Psychiat. <u>54</u> , 197, 1945; Ulett, G., EEG of Dogs with Experimental Space-occupying Intracranial Lesions, Arch. Neurol. and Psychiat. <u>54</u> , 141, 1945; Greenstein, L. and Strauss, H.,

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION REFERENCES
			<p>Correlations Between The EEG and The Histol- ogical structure of gliogenous and metastatic Brain Tumors, J. Mt. Sinai Hosp. <u>12</u>, 874, 1945; Walter, W.G., The EEG in Cases of Cerebral Tumor, Proc. Roy. Soc. Med., March, 1937; Lennox, M., and Brady, B., Paroxysmal Slow Waves in The EEG's of Patients with Epilepsy and with Subcortical Lesions, J. Nerv. and Ment. Dis., <u>104</u>, 237, 1946; Walter, W.G., and Davey, V.J., EEG in Cases of Sub- cortical Tumor, J. Neurol., Neurosurg. and Psychiat. <u>7</u>, 57, 1944; Stewart, W.A., EEG Changes Associated with Different Forms of decreased Intracranial Pressure, Bull. Johns Hopk. Hosp., <u>69</u>, 240, 1941; Williams, The Abnormal Cort- ical Potentials</p>

ANNEX NO. 6 (Cont'd)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
				Associated with High Intracranial Pressure, Brain <u>62</u> , 321, 1939; Smith, J.R., Walter, C.W.P., and Laidlaw, R.W., The EEG in Cases of Neoplasms of The Posterior Fossa, Arch. Neurol. and Psychiat. <u>43</u> , 472, 1940; Cobb, W.A., The EEG Local- ization of Intracranial Neoplasms, J. Neurol. and Psychiat. <u>7</u> , 96, 1944.
Electro- encephal- ography and Vascular Diseases	1	A study of the EEG in the evaluation of cases of vascular disease of the brain with regard to gen- eral findings, local- ization, specific pathology and differential diag- nosis.	C,D	Gibbs and Gibbs, Atlas of EEG; Engel, G.L., et al, Focal EEG Changes During The Scotomas of Migraine, Am. J. Med. Sci. <u>209</u> , 650, 1945; Woodhall, B., and Lowenbach, H., Congenital Cerebral Aneurysm Later- alized by EEG, South. Med. J. <u>36</u> , 580, 1943; Savitsky, N., Pacella, B.L., and Stein, F.D.,

ANNEX NO. 6 (Cont'd)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
				EEG Changes in a Case of Sub- arachnoid Hem- orrhage, Arch. Neurol. and Psychiat. <u>53</u> , 232, 1945; Darrow, C.W., and Graff, C.G., The Relation of EEG to Photo- metrically Observed Changes in The Brain, J. Neurophysiol. <u>8</u> , 449, 1945.
Electro- encephal- ography and Inflammatory, Degenerative and Demyelina- ting Diseases	1	A study of the EEG in the evaluation of cases of inflamma- tory, degenerative and demyelinating diseases of the central nervous sys- tem with regard to significant abnormal- ities and diagnostic considerations.	C,D	Gibbs and Gibbs, Atlas of EEG; Ross, I.S., EEG Findings Dur- ing and After Acute Encephal- itis and Meningo- encephalitis, J. Nervous and Ment. Dis. <u>102</u> , 172, 1945; Greenblatt, M., and Levin, S., Factors Affect- ing The EEG of Patients with Neurosyphilis, Am. J. Psychiat. <u>102</u> , 40, 1945; Hoefler, P.F.A., and Guttmann, S., The EEG in Multiple Sclerosis, Trans. Am. Neurol.Assoc., <u>70</u> , 70, 1945; Calloway, J.L., et al, EEG Find- ings in CNS Syphilis: Before

ANNEX NO. 6 (Cont'd)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION REFERENCES
			and After Treat- ment with Pen- icillin, J. AMA. <u>129</u> , 938, 1945; Sherman, M., and Richard- son, W.P., Cere- bral Malaria: An EEG Study, Arch. Neurol. and Psychiat. <u>53</u> , 84, 1945.
The Electro- encephal- ogram and Disorders of Cerebral Metabolism, Including Drug Effects	2	A study of the changes in the EEG in anoxia, hypo- glycemia and in drug effects: sedatives, alcohol, etc.	C,D Gibbs and Gibbs, Atlas of EEG, Sugar, O., and Gerard, R.W., Anoxia and Brain Potentials, J. Neurophysiol. <u>1</u> , 558, 1938; Hoefer, P.F.A., et al, Convul- sive States and Coma in Cases of Islet Cell Adenoma of The Pancreas, Am. J. Psychiat. <u>102</u> , 486, 1946; Gibbs, F.A., Electrical Act- ivity of The Brain, Ann.Rev. Physiol. <u>7</u> , 1945; Brazier, M.A.B., and Finesinger, J.E., Action of Bar- biturates on The Cerebral Cortex, Arch. Neurol. and Psychiat. <u>53</u> , 51-58, 1945; Greenblatt, M., et al EEG

ANNEX NO. 6 (Cont'd)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION REFERENCES
			Findings in Cases of Bromide intox- ication, Arch. Neurol. and Psychiat. <u>53</u> , 431, 1946; Lennox, M., Effects of Sedative Drugs on the EEG, Am. J. Psychiat. <u>102</u> , 799, 1946; Romano, J., and Engel, G.L., Delirium I and II, Arch. Neurol. and Psychiat. <u>51</u> , 356, 1944; Engel, G.L., and Rosenbaum, M.L., Delirium III, Arch. Neurol. and Psychiat. <u>53</u> , 44, 1945; Greenblatt, M., et al, The EEG Associated with Alcoholism, Arch. Neurol. and Psychiat. <u>52</u> , 290, 1944; Davis, P.A., et al, The Effects of Alcohol Upon the EEG, Quart. J. Studies on Alcohol, <u>1</u> , 626, 1941; Engel, G. L., and Margolin, S.G., Neuropsy- chiatric Disturb- ances in Inter- nal Disease, Metabolic Factors and EEG Correlations, Arch. Int.Med. <u>70</u> , 236, 1942.

ANNEX NO. 6 (Cont'd)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
The Electro- encephal- ogram and Electro- shock Therapy	1	A study of EEG following electro- shock therapy with regard to theoret- ical, therapeutic and prognostic considerations.	C,D	Pacella, B.L., Barrera, S.F., and Kalinowsky, L., Variations in EEG Associ- ated with Electric Shock Therapy of Pat- ients with Mental Disease; Arch. Neurol. and Psychiat. <u>47</u> , 367, 1942; Bogchi, B.K., et al, EEG and Clinical Effects of Electrically Induced Convul- sions in The Treatment of Mental Disorders, Am. J. Psychiat. <u>102</u> , 49, 1945.
The Electro- encephal- ogram and Syncopal States	1	A study of the EEG in the evaluation and differential diagnosis of syn- copal states.	C,D	Engel, G.L., Mechanisms of Fainting, J. Mt. Sinai Hosp. <u>12</u> , 170, 1945; Engel, G.L., et al, Vaso- depressor and Carotid Sinus Syncope, Arch. Int. Med. <u>74</u> , 100, 1944; Romano, J., and Engel, G.L., Vasodepressor and Hysterical Fainting; Psy- chosomatic Med. <u>7</u> , 3, 1945; Redlick, F.C., Value of EEG in The Differ- ential Diagnosis

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SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
				of Epilepsy and Fainting; Dis. Nerv. Syst. <u>7</u> , 362, 1946; Forster, F.M., Roseman, E., and Gibbs, F.A., The EEG Accom- panying Carotid Sinus Reflex and Orthostatic Syncope; Arch. Neurol. and Psychiat. <u>48</u> , 957, 1942; Levin, S., et al, An EEG Study of Cases with Syncope and Related Disorders, Am. J. Psychiat. <u>102</u> , 301, 1945; Sugar, O., EEG in Syncopal Reactions; War Med. <u>8</u> , 9, 1945.
The Electro- encephal- ogram in Psychopathy and The Behavior Disorders	1	A study of the EEG in the evaluation of psychopathic states from the standpoint of specific and differ- ential diagnosis, prognosis and rela- tions to epilepsy and organic brain disease.	C,D	Gibbs and Gibbs, Atlas of EEG; Lindsley, D., EEG, Ch. 33, in J. McV. Hunt, Personality and The Behavior Disorders, 1944; Jasper, H.H., Solomon, P., and Bradley, C., EEG Analyses of Behavior Problem Child- ren, Am. J. Psy- chiat. <u>95</u> , 641, 1938; Simons, D.J., and Diethelme, O.D.,

ANNEX NO. 6 (Cont'd)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
				<p>EEG Studies of Psychopathic Personalities, Arch. Neurol. and Psychiat. <u>55</u>, 619, 1946; Gottlieb, J.S., Ashby, M.C., and Knott, J.R., Primary Behavior Disorders and Psychopathic Personality, Arch. Neurol. and Psychiat. <u>56</u>, 381, 1946; Gibbs, F.A., Bagchi, B.K., and Bloomberg, W., EEG Study of Criminals, Am. J. Psychiat. <u>102</u>, 294, 1945; Hill, D., and Watterson, D., EEG Studies of Psychopathic Personalities, J. Neurol. and Psychiat. <u>5</u>, 47, 1942; Simon, B., O'Leary, J., and Ryan, J., Cerebral Dysrhythmia and Psychopathic Personalities, Arch. Neurol. and Psychiat. <u>56</u>, 677, 1946.</p>
The Electro-encephalogram in The Psychoneuroses and	1	A study of the EEG findings in cases of psychoneuroses and psychogenic psychoses, with an evaluation of	C,D	Gibbs and Gibbs, Atlas of EEG; Lindsley, D.B., EEG, in J.McV. Hunt, Personality

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SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
Psychoses		the limitations of EEG in these cases at the present time.		and Behavior Disorders, Ch. 33, 1944; Brazier, M.A.B., et al, A Con- trast Between The EEG's of 100 Psycho- neurotic Pat- ients and Those of 500 Normal Adults, Am.J. Psychiat. <u>101</u> , 443, 1945; Finesinger, J. et al, The Effect of Anoxia as Measured by The EEG and Interaction Chronogram on Psychoneurotic Patients, Am. J. Psychiat. <u>103</u> , 738, 1947; Liberson, W.T., Functional EEG in Mental Dis- orders, Dis. Nerv. Sept. <u>5</u> , 357, 1944; Rockwell, F.V., and Simons, D. J., EEG and Personality Organization in Obsessive Com- pulsive Reactions, Arch. Neurol. and Psychiat. <u>57</u> , 71, 1947; Finley, K.H., and Campbell, C.M., EEG in Schizophrenia, Am.J. Psychiat.

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SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
				98, 374, 1941; Liberson, W.T., and Seguin, C. A., Brain Waves and Clinical Features in Arteriosclerotic and Senile Mental Pat- ients, Psy- chosom. Med. 7, 35, 1945.
Special Problems in Military Electro- encephal- ography	1	A survey of the utilization of electro-encephal- ography in aviation medicine, as a screening device, in evaluation of cases of suspected epilepsy and in the evalua- tion of cases of head trauma.	C,D	TB MED 74; Silverman, D., EEG in The Army General Hospital; War Med. 5, 163, 1944; Schwab, R.S., Use of EEG in The Navy in War- time; Arch. Neurol. and Psychiat. 50, 489, 1943; Solomon, P., et al, EEG in The Selection of Naval Recruits, U.S. Nav. M. Bull, 41, 1310, 1943; Roseman, E., The Epileptic in The Army, Am. J. Psychiat. 101, 349, 1944; Robinson, L.J., The EEG in Some Military and Selective Service Convul- sive and Non- convulsive Pro- blems, Am. J.

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SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
				Psychiat. <u>102</u> , 305, 1945; Thorner, M., Gibbs, F.A. and Gibbs, E. L., Relation Between EEG and Flying Abil- ity, War Med. <u>2</u> , 255, 1943.
Review of The Indica- tions and Limitations of Electro- encephal- ography	1	A systematic evalua- tion of the indica- tions, limitations, usage and value of electro-encephal- ography as a diagnos- tic and prognostic aid in clinical neuro- psychiatry and as a research technique in neurophysiology.	C,D	All previous references.
Electro- myography	2	A study of the electromyogram, as obtained with the EEG apparatus, in the dyskinesias, lower motor neuron and peripheral nerve disease. An evalua- tion of its use in diagnosis and prog- nosis.	C,D	Weddell, G., Electromyo- graphy in Clinical Med- icine, Proc. Roy. Soc. Med. <u>36</u> , 513, 1943; Hoefler, P.F.A., Innervation and "Tonus" of Striated Muscle in Man, Arch. Neurol. and Psychiat. <u>46</u> , 947, 1941; Hoefler, P.F.A., Physiology of Motor Innerva- tion in The Dyskinesias, ARNMD, <u>21</u> , 502, 1941; Hoefler, P.F.A., and Guttmann, S.A.,

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				Electromyography as a Method for Determination of Level of Lesions in The Spinal Cord, Arch. Neurol. and Psychiat. <u>51</u> , 415, 1944; Brazier, M.A.B., et al, Electromyography in Differential Diagnosis of Ruptured Cervical Disk., Arch. Neurol. and Psychiat. <u>56</u> , 651, 1946; Schwab, R.S., et al, Quantitation of Muscular Function in Cases of Poliomyelitis and Other Motor Nerve Lesions, Arch. Neurol. and Psychiat. <u>50</u> , 538, 1943.
Practical Exercises in EEG Analysis and Interpretation	20	A study, by the student, of a collection of normal and abnormal electroencephalograms correlating the EEG interpretation with the clinical problem. Supervised practical application of all learned principles in the classification, interpretation and reporting of the routine laboratory cases. Practical examinations in EEG interpretation.	PE	All previous references.

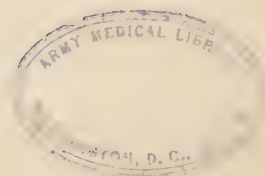
ANNEX NO. 7

PHYSICAL TRAINING
(20 Hours)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
Introduction	1	Outlines the purpose, scope, general program, administration and instructional procedures and hygienic considerations regarding physical training. Programs for physically handicapped followed by Training Film TC 87.	C, F	FM's 21-5, 21-20; TM 21-250; WD Tng Cir 7, 1946; TF TC 87.
Formations, Commands, Cadence and Methods of Introducing Exercises	1	Instruct the student in the Army's objective of physical training programs and the sound techniques of teaching other physical activities. Demonstration and application of formations, commands, cadence, introducing exercises and types of exercises.	D, PE	FM's 21-5, 21-20, Ch. 2, Pp. 8-21; TM 21-250.
Physical Conditioning (Starting Positions and Exercises)	6	Formations used in physical training. Explanation, demonstration and application of various starting positions, warm-up and conditioning exercises.	D, PE	FM 21-20, Pp. 17-30, 47-60; TM 21-250.
Physical Conditioning (Warm-up, Conditioning and Guerrilla Exercises)	1	Explanation on the use and types of guerrilla exercises, types of commands utilized and various guerrilla exercises. Explanation, demonstration and application of warm-up, conditioning and guerrilla exercises.	D, PE	FM 21-20, Pp. 17-21, 47-49, 50-77, 152-156.

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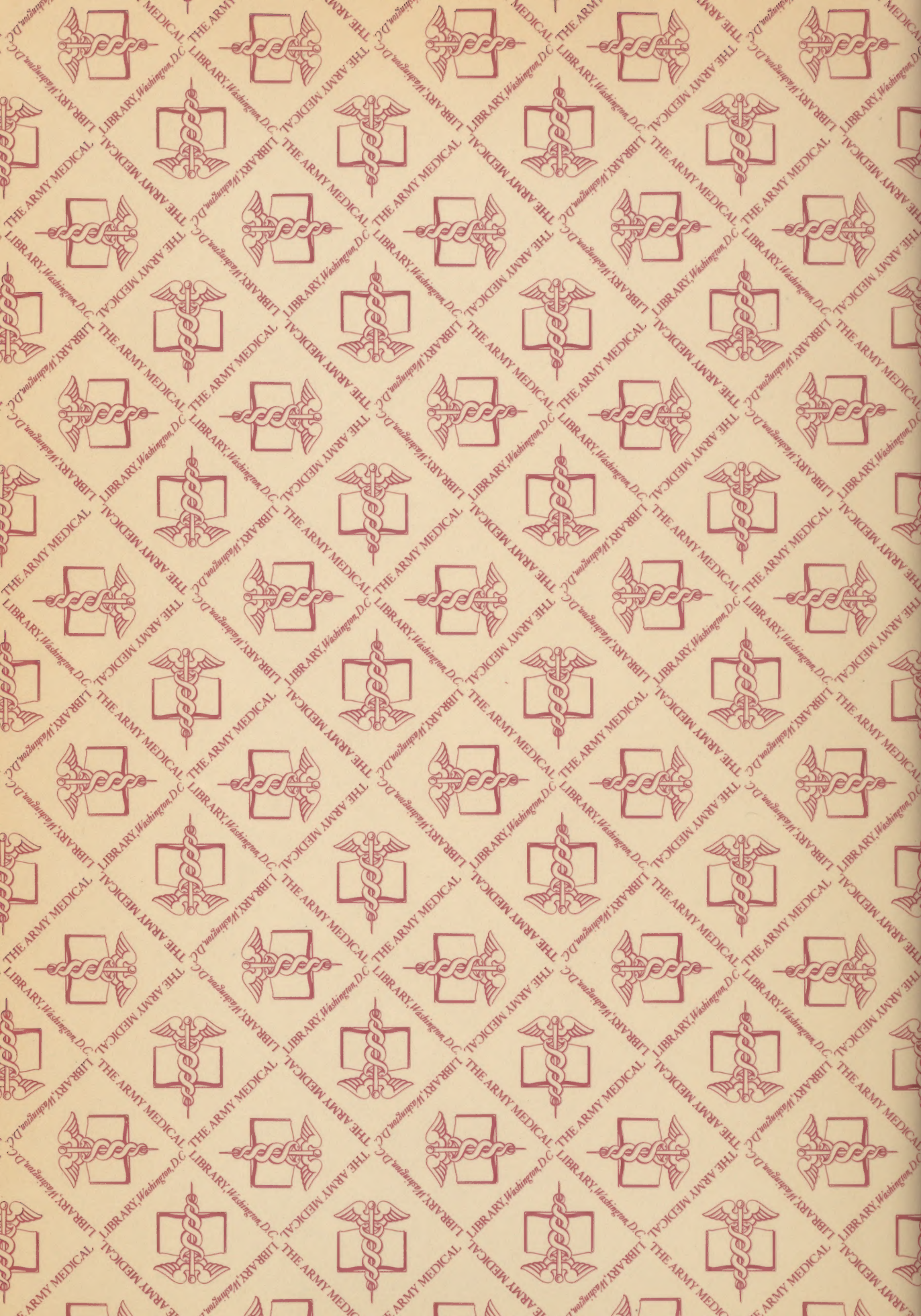
SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
Exercises, Mass Games and Athletics	3	Explanation, demon- stration, and appli- cation of warm-up, conditioning and guerrilla exercises. Explanation and appli- cation of mass games and athletics.	D, PE	FM 21-20, pp. 17-21, 47-49, 50-77, 152-171, 192-195.
Applicatory Periods	8	Students chosen from class to organ- ize and conduct phy- sical training periods. Periods to consist of warm- up, conditioning, and guerrilla exer- cises followed by mass games and athletics. Period to be supervised by instructor and assistants.	D, PE	FM 21-20, pp, 17-21, 47-49, 50-77, 152-171, 192-210; TM 21-250.



ANNEX NO. 8

TROOP INFORMATION
(4 Hours)

SUBJECT AND FILE NUMBER	HOURS	SCOPE OF INSTRUCTION	TYPE OF INSTRUCTION	REFERENCES
Troop Information Program	4	Open forum discussion of problems of the world today. Students will be encouraged to openly discuss topics of general public interest. Current training films will be shown.	L,C, F	Current Magazines, Army Talks; Training Films.



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